

REMARKS

Claims 1-26 are all the claims pending in the application.

Claims 23-26 have been amended for clarity to include definitions for the substituent groups of the structural formulae. Support for the changes to claims 23-26 may be found in the specification as originally filed, for example, at page 29, lines 1-6 and 10-11. Entry of the Amendment is requested as placing the application in better form for appeal by materially reducing or simplifying the issues for appeal.

I. Formal Matters

Applicants wish to thank the Examiner for the helpful and courteous telephone interview conducted on February 11, 2002. The "Interview Summary" (Paper No. 22) accurately memorializes the agreement that claims 23-25 are not rejected based on any art and that they should be considered to be "objected to as depending upon rejected claims." ✓

II. Response To The Double Patenting Rejection

Claims 1, 3, 8 and 14-15 are rejected under the judicially created doctrine of obviousness-type double patenting as allegedly being unpatentable over claims 1-16 of U.S. Patent No. 6,159,656. ✓

The Examiner has maintained the obviousness-type double patenting rejection. The Examiner states that the person who signed the terminal disclaimer is not recognized as an officer of the assignee, and he has not been established as being authorized to act on behalf of the assignee.

To facilitate prosecution of the instant application, enclosed herewith is a paper entitled Submission of Terminal Disclaimer and a second terminal disclaimer signed by Mr. Brett S. Sylvester, who appears on the Declaration and Power of Attorney filed July 19, 1999.

For the above reasons, it is requested that the obviousness-type double patenting rejection over U.S. Patent No. 6,159,656 be reconsidered and withdrawn.

III. Response To The Rejection Under 35 U.S.C. §112, Second Paragraph

Claims 23-26 are rejected under 35 U.S.C. §112, second paragraph, as allegedly being indefinite. ✓

The Examiner notes that new claims 23-26 do not include definitions for substituents "R" and "A."

Claims 23-26 have been amended to recite the definitions for the substituent groups "R" and "A."

For the above reasons, it is respectfully submitted that Applicants' claims are clear and definite and it is requested that the rejection under 35 U.S.C. §112 be reconsidered and withdrawn.

IV. Response To The Rejections Based on Suwa

Claims 1-15 and 23-25 are rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Suwa (EP 789,278).

The Examiner states that the comparative data have been reviewed. The Examiner states that Applicants were successful in comparing the closest art by using the MEGAFAC F171 surfactant, which is within the scope of the claimed invention, and comparing it with a surfactant outside the scope of the claims (polyoxyethylene nonyl phenyl ether). However, the Examiner states that the comparative data is not convincing. The Examiner states that it is unclear as to how the results are to be considered to be unexpected and superior.

The Examiner also states that the film rate changes are "slightly less than 5%" and alleges that such a change "is not a substantial variation". The Examiner also states that the descriptions A (rectangular) and B (anything other than rectangular) are vague and that she is unable to make a clear determination as to an unexpected result.

Applicants respectfully submit that the present invention is not obvious over the teachings of Suwa and request that the Examiner reconsider and withdraw this rejection in view of the following remarks.

First of all, as to claims 23-25, as stated in the Examiner's Interview Summary Form, the Examiner has agreed that claims 23-25 are not rejected based

on any art and they are considered to be "objected to as depending upon rejected claims."

As to the Examiner's position that a residual film rate of 5% is not a substantial variation, in a microphotoresist, the resist residual film rate is generally required to be 99% or more. Recently, in the production of semiconductor devices, there has been a strong demand for higher residual film rates.

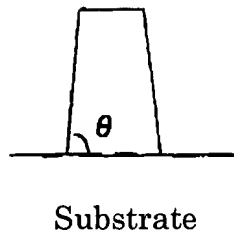
If the residual film rate of the resist is low, the following problems occur:

- (1) The desired etching resistance is not obtained; and
- (2) The coverage properties of the resist on substrates with differences in levels (i.e., not perfectly flat) are poorer. As a result, the breaking of wire is caused.

That is, the residual film rate is ideally preferably 100%. Accordingly, a difference in the residual film rate of "5%" is regarded as an extremely large difference to one skilled in the art and the semiconductor industry. Thus, the difference in the residual film rate of 5%, as obtained by Applicants, is an unexpected result.

With respect to the evaluation of the profile "A" and "B", the shape of the resist is shown in Figure 1 below (a cross section of a 0.25 μm pattern is schematically shown).

Figure 1



When the angle (θ) between the substrate and the side-wall of the resist pattern is small, the profile (i.e., the shape of resist pattern) becomes a tapered shape (i.e., a T-shape). When the angle (θ) between the substrate and the sidewall is large, the profile becomes a rectangular shape.

Accordingly, in the present invention as described in Applicants' specification, the tapered profile (i.e. the T—shape) (designated as "B") means that the angle (θ) between the substrate and the sidewall is about from 80 to 85°.

Additionally, the rectangular profile (i.e., the rectangular shape) (designated as "A") means that the angle (θ) between the substrate and the sidewall is about from 85 to 90°.

For the measurement of the line width for the resist, the angle (θ) between the substrate and the sidewall is most preferably from 88 to 89°.

The angle between the substrate and the sidewall for contrasting Profiles "A" and "B" shown in Table A' of the previous declaration is shown below.

	<u>Profile</u>	<u>Angle between Substrate and Sidewall</u>
Example a	A	89
Example b	A	88
Comparative Example a'	B	85
Comparative Example b'	B	86

As shown by the comparative evidence, unexpectedly, achievement of both improved performance in the development defect and the realization of a rectangular profile are obtained. The combination of these two properties has been extremely difficult to obtain and was first realized by the combination of the present invention.

Additionally, the angle between the substrate and the sidewall of the examples according to the present invention is in the range of from 88 to 89 °, which is ideal.

For the above reasons, it is respectfully submitted that the subject matter of claims 1-15 and 23-25 is neither taught by nor made obvious from the disclosures of Suwa and it is requested that the rejections under 35 U.S.C. §103(a) be reconsidered and withdrawn.

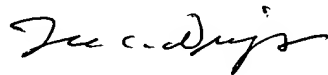
V. Conclusion

In view of the above, Applicants respectfully submit that their claimed invention is allowable and ask that the obviousness-type double patenting rejection, the rejection under 35 U.S.C. §112 and the rejection under 35 U.S.C. §103 be reconsidered and withdrawn. Applicants respectfully submit that this case is in condition for allowance and allowance is respectfully solicited.

If any points remain at issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the local exchange number listed below.

Applicants hereby petition for any extension of time which may be required to maintain the pendency of this case, and any required fee for such extension is to be charged to Deposit Account No. 19-4880.

Respectfully submitted,



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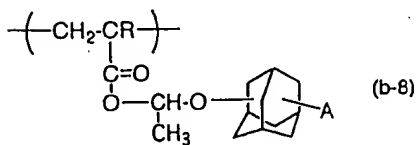
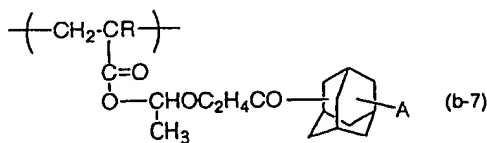
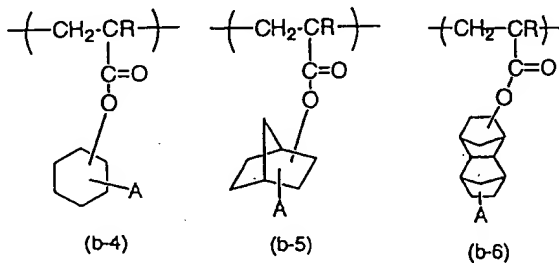
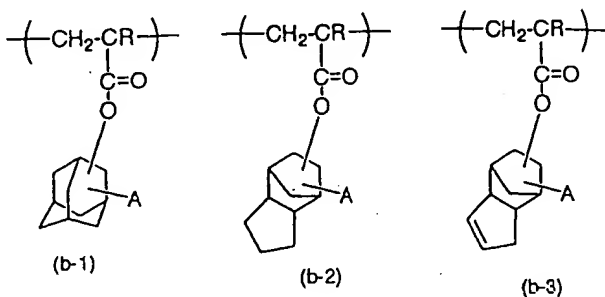
Date: May 10, 2002

APPENDIX
VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS:

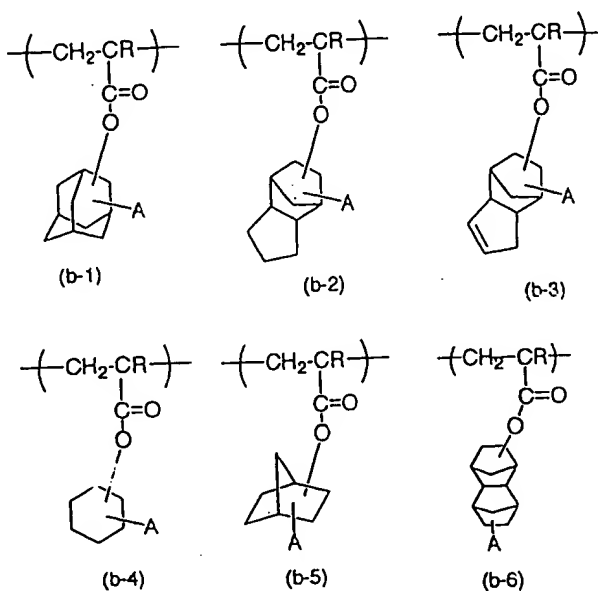
The claims are amended as follows:

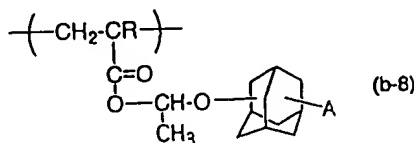
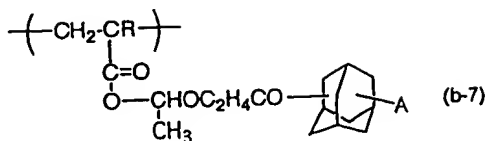
Claim 23 (amended). The positive photosensitive resin composition as claimed in claim 1, wherein said polymer which has alicyclic hydrocarbon skeletons and decomposes under the action of an acid to become alkali soluble contains a repeating unit selected from the group consisting of repeating units having the structural formulas (b-1) to (b-8):



wherein A is selected from the group consisting of hydrogen, hydroxyl, a carboxyl group, an alkoxycarbonyl group, a substituted or unsubstituted alkyl group having from 1 to 10 carbon atoms, a substituted or unsubstituted alkoxy group having from 1 to 10 carbon atoms, and a substituted or unsubstituted alkenyl group having from 1 to 10 carbon atoms; and R is selected from the group consisting of hydrogen and a substituted or unsubstituted alkyl group having 1 to 3 carbon atoms.

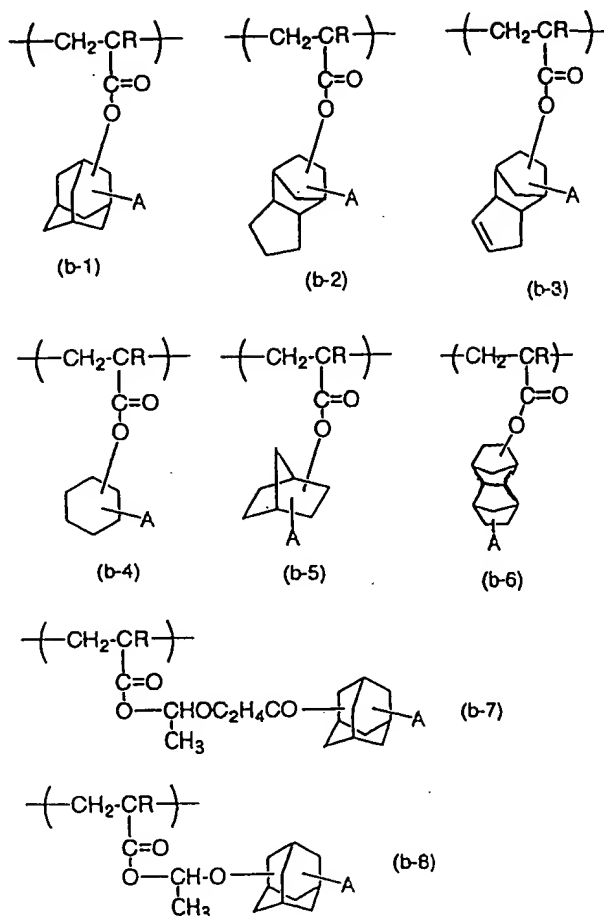
Claim 24 (amended). The positive photosensitive resin composition as claimed in claim 2, wherein said polymer which has alicyclic hydrocarbon skeletons and decomposes under the action of an acid to become alkali soluble contains a repeating unit selected from the group consisting of repeating units having the structural formulas (b-1) to (b-8):





wherein A is selected from the group consisting of hydrogen, hydroxyl, a carboxyl group, an alkoxycarbonyl group, a substituted or unsubstituted alkyl group having from 1 to 10 carbon atoms, a substituted or unsubstituted alkoxy group having from 1 to 10 carbon atoms, and a substituted or unsubstituted alkenyl group having from 1 to 10 carbon atoms; and R is selected from the group consisting of hydrogen and a substituted or unsubstituted alkyl group having 1 to 3 carbon atoms.

Claim 25 (amended). The positive photosensitive resin composition as claimed in claim 9, wherein said polymer which has alicyclic hydrocarbon skeletons and decomposes under the action of an acid to become alkali soluble contains a repeating unit selected from the group consisting of repeating units having the structural formulas (b-1) to (b-8):



wherein A is selected from the group consisting of hydrogen, hydroxyl, a carboxyl group, an alkoxycarbonyl group, a substituted or unsubstituted alkyl group having from 1 to 10 carbon atoms, a substituted or unsubstituted alkoxy group having from 1 to 10 carbon atoms, and a substituted or unsubstituted alkenyl group having from 1 to 10 carbon atoms; and R is selected from the group consisting of hydrogen and a substituted or unsubstituted alkyl group having 1 to 3 carbon atoms.

$$\left(\text{CH}_2 - \text{CR} \right)_n$$

$$\begin{array}{c} | \\ \text{C}=\text{O} \\ | \\ \text{O} \\ | \\ \text{A} \end{array}$$
 (b-1)

$$\left(\text{CH}_2 - \text{CR} \right)_n$$

$$\begin{array}{c} | \\ \text{C}=\text{O} \\ | \\ \text{O} \\ | \\ \text{A} \end{array}$$
 (b-2)

$$\left(\text{CH}_2 - \text{CR} \right)_n$$

$$\begin{array}{c} | \\ \text{C}=\text{O} \\ | \\ \text{O} \\ | \\ \text{A} \end{array}$$
 (b-3)

$$\left(\text{CH}_2 - \text{CR} \right)_n$$

$$\begin{array}{c} | \\ \text{C}=\text{O} \\ | \\ \text{O} \\ | \\ \text{A} \end{array}$$
 (b-4)

$$\left(\text{CH}_2 - \text{CR} \right)_n$$

$$\begin{array}{c} | \\ \text{C}=\text{O} \\ | \\ \text{O} \\ | \\ \text{A} \end{array}$$
 (b-5)

$$\left(\text{CH}_2 - \text{CR} \right)_n$$

$$\begin{array}{c} | \\ \text{C}=\text{O} \\ | \\ \text{O} \\ | \\ \text{A} \end{array}$$
 (b-6)

$$\left(\text{CH}_2 - \text{CR} \right)_n$$

$$\begin{array}{c} | \\ \text{C}=\text{O} \\ | \\ \text{O} - \text{CH}(\text{OCH}_3) - \text{C}_2\text{H}_4 - \text{CO} - \text{A} \end{array}$$
 (b-7)

$$\left(\text{CH}_2 - \text{CR} \right)_n$$

$$\begin{array}{c} | \\ \text{C}=\text{O} \\ | \\ \text{O} - \text{CH}(\text{OCH}_3) - \text{O} - \text{A} \end{array}$$
 (b-8)

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AMENDMENT UNDER 37 C.F.R. § 1.116
U.S. Appln. No. 09/295,329

Attorney Docket No. Q54114

1 to 10 carbon atoms, and a substituted or unsubstituted alkenyl group having from 1 to 10 carbon atoms; and R is selected from the group consisting of hydrogen and a substituted or unsubstituted alkyl group having 1 to 3 carbon atoms.